“Discussion & Draft Recommendations”

Tigner and Marx Reports

The $\varepsilon \rightarrow 2\varepsilon$ Reports

In 1980 the Tigner Report noted that 2% of the HEP budget was invested in accelerator R&D aimed at the long-term , and this was inadequate. The report recommended that the investment be increased to 4%.

In 1996 the HEPAP Sub-panel on the Assessment of the Status of Accelerator Physics (Marx Report: DOE/ER-0679) noted the conclusions of the Tigner Report, endorsed them, and again recommended that the 2.5% investment of the HEP budget in long-term accelerator R&D be increased to 4%.

The 2002 HEPAP report also emphasized the importance of accelerator R&D for the long-term: "*We recommend that vigorous long-term R&D aimed towards future high-energy accelerators be carried out at high priority within our program*."

Fermilab Base Program Support

	Medium Term R&D	Long Term R&D
Direct Costs (M$)		
Linear Collider	2.3	
SCRF & A0 Program	2.0	0.6
SC Magnet R&D	3.2	
Muons		0.7
Sub-Total	**7.5**	**1.3**
G&A (25%)	1.9	0.3
TOTAL (M$)	**9.4**	**1.6**
% Lab Budget	3.2%	0.6%

INCONSISTENT WITH INTEGRATING few × 100M$ R&D

NOT EVEN 2%

Preamble

There is general agreement amongst the committee members that:

1. The SCRF & advanced accelerator R&D at A0, MUCOOL & Neutrino Factory R&D, SC Magnet R&D, and the theory and simulation efforts at Fermilab aimed at the medium- and long-term are well motivated and should be supported, but …

2. … they all need increased effort &/or support to achieve their goals on a timescale matched to the long-term needs of Fermilab and High Energy Physics.

3. If we really want an accelerator-based particle physics future beyond the 20 year time-frame, the situation is serious.

4. We note that for the last (almost) 25 years committees have been recommending increased support for accelerator R&D ($\varepsilon \rightarrow 2\varepsilon$).

DRAFT RECOMMENDATION 1

Lack of explicit recognition that the approved accelerator R&D projects at Fermilab are an integral part of the core scientific program limits the communities exposure to the R&D program, and impedes a broader understanding of the appropriate level of support needed to provide for the long term future.

We recommend that the approved accelerator R&D programs at Fermilab are recognized as an integral part of the scientific program, and are advertised as such on the Comitium wall, within the program yearbook, and within Directorate-level talks.

DRAFT RECOMMENDATION 2

The Tigner (1980) and Marx (1996) panels recommended that 4% of the HEP budget be invested in accelerator R&D aimed at the long-term. The present investment at Fermilab is about 0.6%. The committee believes that the major medium-term (non-linear collider) and long-term accelerator R&D programs at Fermilab are well motivated, but require increased support. In particular, the magnet R&D program requires an increase in effort, the SCRF and advanced accelerator R&D at A0 requires an increase in M&S and effort, the MUCOOL program needs support to construct a beamline to the MUCOOL Test Area, and the Neutrino Factory design and simulation group needs an increase in effort.

We recommend that the approved non-linear collider related accelerator R&D programs at Fermilab that are aimed at the medium- and long-term be examined by the Director to establish the new increased level of support required to enable each program to achieve its goals, and that the Director then establishes with the DOE the level of Fermilab base program support for this accelerator R&D.

DRAFT RECOMMENDATION 3

The present accelerator R&D programs at Fermilab aimed at the medium-term and long-term are proposal driven, and subject to peer review. However at present there is no uniformity in the review and approval process, and the existing process gives little exposure of the approved accelerator R&D program to the particle physics community.

We recommend that the Director examines the peer review and approval process for accelerator R&D aimed at the medium- and long-term, and seeks to modify the process to improve its uniformity and give greater visibility of the proposed and approved R&D to the particle physics community. We further recommend that if the approved accelerator R&D involves a significant collaboration with outside institutions, support for the approved programs be detailed in an MOU negotiated between the Directorate and the proponents.

DRAFT RECOMMENDATION 4

Given tight budgets, we recognize that launching a new advanced accelerator R&D initiative is not straight forward. However, even with very tight budgets, we believe there is a real need to increase the investment at Fermilab in the long-term.

We recommend that the Director appoint a task force to identify new significant advanced accelerator R&D initiatives that could be pursued by Fermilab staff, and that the task force report back to the Director by a specified time. We encourage collaboration with local laboratories and universities, and in national and international collaborative efforts.